

What is claimed is:

1. In a routing system having a plurality of route processors, including a first and a second route processor, a method of determining a route to a destination in a network, the method comprising:

partitioning a global routing information base (gRIB) such that it executes as processes on two or more of the plurality of route processors;

establishing a first routing protocol process on one or more of the plurality of route processors;

establishing a second routing protocol process on one or more of the plurality of route processors;

determining, using the first routing protocol process, a route to a destination in a given network;

storing the route in a routing information base (RIB) associated with the first routing protocol process;

updating the gRIB with the route stored in the routing information base (RIB) associated with the first routing protocol process; and

writing the route from the gRIB to the routing information base (RIB) associated with the second routing protocol process.

2. The method according to claim 1, wherein partitioning the gRIB such that it executes as processes on the first and second route processors includes storing, as a function of a prefix range, a first portion of the gRIB in memory of the first route processor and a second portion of the gRIB in memory of the second route processor.

3. The method according to claim 2, wherein partitioning the gRIB such that it executes as processes on two or more of the route processors further includes storing a directory of prefix ranges in memory of the route processors associated with each routing protocol process.

4. The method according to claim 1, wherein partitioning the gRIB such that it executes as processes on the first and second route processors includes storing all routes for a first virtual private network (VPN) in memory of the first route processor and all routes for a second VPN in memory of the second route processor.

5. The method according to claim 4, wherein partitioning the gRIB such that it executes as processes on two or more of the route processors includes storing a directory of VPNs in memory of the route processors associated with each routing protocol process.

7. An article comprising a computer readable medium having instructions thereon, wherein the instructions, when executed in a computer, create a system for executing the method of claim 1.

8. In a routing system having a plurality of route processors, including a first and a second route processor, a method of determining a route to a destination in a network, the method comprising:

partitioning a global routing information base (gRIB) such that it executes as processes on two or more route processors, wherein partitioning includes storing a first portion of the gRIB in memory of the first route processor and a second portion of the gRIB in memory of the second route processor;

establishing a routing protocol process on one or more of the plurality of route processors;

determining, using the routing protocol process, a route to a destination in a given network;

storing the route in a routing information base (RIB) associated with the routing protocol process; and

updating the gRIB with the route stored in the routing information base (RIB) associated with the routing protocol process, wherein updating includes writing the route to one or more of the portions of the gRIB.

9. The method according to claim 8, wherein storing a first portion of the gRIB in memory of the first route processor and a second portion of the gRIB in memory of the second route processor includes partitioning the gRIB as a function of a prefix range.

10. The method according to claim 9, wherein partitioning the gRIB such that it executes as processes on two or more of the route processors further includes storing a directory of prefix ranges in memory of the route processors associated with the routing protocol process.

11. The method according to claim 8, wherein partitioning the gRIB further includes storing all routes for a first virtual private network (VPN) in memory of the first route processor and all routes for a second VPN in memory of the second route processor.

12. The method according to claim 11, wherein partitioning the gRIB such that it executes as processes on two or more of the route processors includes storing a directory of VPNs in memory of the route processors associated with each routing protocol process.

13. An article comprising a computer readable medium having instructions thereon, wherein the instructions, when executed in a computer, create a system for executing the method of claim 8.

14. In a routing system having a plurality of route processors, including a first and a second route processor, a method of determining a route to a destination in a network, the method comprising:

- providing a routing protocol process and a routing protocol routing information base (RIB) associated with the routing protocol process;
- partitioning a routing protocol process as a function of prefix range such that it executes as partitioned routing protocol processes on two or more route processors, wherein partitioning includes:
  - separating the routing protocol routing information base (RIB) associated with the routing protocol process into a first portion and a second portion, wherein separating is a function of the prefix range associated with a route;
  - storing the first portion of the routing protocol RIB in memory of the first route processor; and
  - storing the second portion of the routing protocol RIB in memory of the second route processor;
- establishing a global routing information base (RIB) process on one or more of the plurality of route processors;
- determining, via one of the partitioned routing protocol processes, a new route to a destination in a given network;
- storing the new route in one of the portions of the routing protocol RIB, wherein storing is a function of the prefix range associated with the new route;
- determining if the gRIB should be updated with the new route; and
- if the gRIB should be updated with the new route, updating the gRIB with the new route.

15. The method according to claim 14, wherein establishing a global routing information base (RIB) process on one or more of the plurality of route processors

includes storing a directory of prefix ranges in memory of the route processors associated with the global RIB process.

16. The method according to claim 15, wherein the method further includes storing a route from the gRIB to the routing protocol RIB, wherein storing includes accessing the directory of prefix ranges in memory of the route processors associated with the global RIB process.

17. The method according to claim 14, wherein the method further includes storing a route from the gRIB to the routing protocol RIB, wherein storing includes querying each partitioned routing protocol process to determine if it handles the route to be stored.

18. An article comprising a computer readable medium having instructions thereon, wherein the instructions, when executed in a computer, create a system for executing the method of claim 14.

19. In a routing system having a plurality of route processors, including a first and a second route processor, a method of determining a route to a destination in a network having a plurality of virtual private networks, the method comprising:

providing a routing protocol process and a routing protocol routing information base (RIB) associated with the routing protocol process;

partitioning a routing protocol process as a function of virtual private network (VPN) such that the routing protocol process executes as partitioned routing protocol processes on two or more route processors, wherein partitioning includes:

separating the routing protocol routing information base (RIB) associated with the routing protocol process into a first portion and a second

portion, wherein separating is a function of the virtual private network associated with a route;

storing the first portion of the routing protocol RIB in memory of the first route processor; and

storing the second portion of the routing protocol RIB in memory of the second route processor;

establishing a global routing information base (RIB) process on one or more of the plurality of route processors;

determining, via one of the partitioned routing protocol processes, a new route to a destination in a given network;

storing the new route in one of the portions of the routing protocol RIB, wherein storing is a function of the virtual private network associated with the new route;

determining if the gRIB should be updated with the new route; and

if the gRIB should be updated with the new route, updating the gRIB with the new route.

20. The method according to claim 19, wherein establishing a global routing information base (RIB) process on one or more of the plurality of route processors includes storing a directory of VPNs in memory of the route processors associated with the global RIB process.

21. The method according to claim 20, wherein the method further includes storing a route from the gRIB to the routing protocol RIB, wherein storing includes accessing the directory of VPNs in memory of the route processors associated with the global RIB process.

22. The method according to claim 19, wherein the method further includes storing a route from the gRIB to the routing protocol RIB, wherein storing includes

querying each partitioned routing protocol process to determine if it handles the route to be stored.

23. An article comprising a computer readable medium having instructions thereon, wherein the instructions, when executed in a computer, create a system for executing the method of claim 19.

24. A routing system for routing according to a routing protocol, the routing system comprising:

- a plurality of route processors, including a first and a second route processor;
- a global routing information base (gRIB) process executing on two or more of the plurality of route processors, wherein the gRIB process stores a portion of the gRIB in memory of the first route processor and a portion of the gRIB in memory of the second processor; and

- a routing protocol process executing on one or more of the route processors, wherein the routing protocol process applies a policy corresponding to the routing protocol to select routes according to rules of the routing protocol and downloads the selected routes to the global RIB process for storage in the gRIB.

25. The routing system according to claim 24, wherein the routing protocol process includes a directory of prefix ranges for identifying the portion of the gRIB containing a desired route.

26. The routing system of claim 24, wherein the global RIB process stores a portion of a global RIB in memory of the first route processor as a function of a prefix range and wherein the global RIB process stores a directory of prefix ranges in each route processor associated with the routing protocol process.

27. The routing system of claim 26, wherein the routing protocol process stores portions of a routing protocol RIB associated with the routing protocol process in memory of two or more route processors, wherein the portions are partitioned as a function of a second prefix range.

28. The routing system of claim 24, wherein the portion of the global RIB in memory of the first route processor includes all routes for a first VPN and wherein the portion of the global RIB in memory of the second route processor includes all routes for a second VPN.

29. The routing system of claim 24, wherein the routing protocol process stores portions of a routing protocol RIB associated with the routing protocol process in memory of two or more route processors, wherein the portions are partitioned as a function of a prefix range.

30. The routing system of claim 24, wherein the routing protocol process stores portions of a routing protocol RIB associated with the routing protocol process in memory of two or more route processors, wherein the portions are partitioned as a function of virtual private network (VPN).

31. A routing system capable of routing according to a first and a second routing protocol, the routing system comprising:

- a plurality of route processors, including a first, a second and a third route processor;

- a global routing information base (RIB) process executing on the first and second route processors, wherein the global RIB process stores a portion of a global RIB in memory of each of the first and second route processors;

- a first routing protocol process executing on the third route processor, wherein the first routing protocol process applies a policy corresponding to the first



routing protocol to select routes according to rules of the first routing protocol and downloads the selected routes to the global RIB process for storage in the global RIB; and

a second routing protocol process executing on one or more of the plurality of route processors, wherein the second routing protocol process applies a policy corresponding to the second routing protocol to select routes according to rules of the second routing protocol and downloads the selected routes to the global RIB process for storage in the global RIB.

32. The routing system of claim 31, wherein the global RIB process stores a portion of a global RIB in memory of the first route processor as a function of a prefix range.

33. The routing system of claim 31, wherein the global RIB process stores a portion of a global RIB in memory of the first route processor as a function of a prefix range and wherein the global RIB process stores a directory of prefix ranges in each of the first and second route processors .

34. The routing system of claim 33, wherein the routing protocol process stores portions of a routing protocol RIB associated with the routing protocol process in memory of two or more route processors, wherein the portions are partitioned as a function of a second prefix range.

35. The routing system of claim 31, wherein the portion of the global RIB in memory of the first route processor includes all routes for a first VPN and wherein the portion of the global RIB in memory of the second route processor includes all routes for a second VPN.

36. The routing system of claim 31, wherein the routing protocol process stores portions of a routing protocol RIB associated with the routing protocol process in memory of two or more route processors, wherein the portions are partitioned as a function of a prefix range.

37. The routing system of claim 31, wherein the routing protocol process stores portions of a routing protocol RIB associated with the routing protocol process in memory of two or more route processors, wherein the portions are partitioned as a function of virtual private network (VPN).